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The Coal Trade of London.

The companion to the Rritish Almanac for 1850, gives an account of the commercial arrangements connected with the supply of coal to the metropolis; a supply which involves an expenditure of capital, and an amount of employment, such as few would suppose who have not investigated the subject. Although the colliery statistics of Northumberland and Durham belong to the country at large rather than to London alone, yet the enormous consumption in London renders it desirable to begin at the first great stage of the subject, and to follow the commercial history of a ton of coal from the pit's mouth to the cellar of the consumer.

It will assist us in this object if we first give a rapid glance at the legislative enactments now in force respecting the London coal trade.

In 1831 an Act was passed (1 & 2 Will. 4, c. 76), which has been the basis of much of the subsequent legislation. It swept away most of the provisions of six former Acts of Parliament, which had long lost their working efficiency; and laid down others in their stead. By the clauses of this Act the land and buildings of the Coal Exchange, which had in 1807 been vested in the Corporation of London, were continued under the same trust. The Coal Exchange was to be made a free open market, to be called the "Coal Market." The Corporation was empowered to appoint and pay clerks and other officers of the Coal Market; to enlarge or to remove the market whenever deemed expedient; to purchase sites and tenements for any new building; to appropriate or dispose of the ground abandoned by such change; and to levy a duty of one penny on every ton of coals brought into the Thames westward of Gravesend, the said duty to remain in force until all the expenses attending the Coal Market were defrayed. All expenses connected with the erection or alteration of the Coal Exchange, and with the management of the market, were to be provided by loans, raised on the security of the penny duty. The Corporation was empowered to make bye-laws for the management of the market; and to appoint committees of disinterested persons to conduct the management. Then follow numerous regulations, declaratory that coals should be sold by weight instead of measure in the port of London; that a penalty should attach to the selling of coal as of other than its real quality; that lightermen may carry on partnership with coal dealers, for the transfer of their own coals on the Thames, under certain restrictions; that the seller of any quantity above 5 cwt. coals, to any person living within 25 miles of the General Post Office, shall send to the purchaser a ticket, calculated to act as guarantee for the quantity and quality of the coals delivered; that the means shall be provided for weighing the coals if required, and of enforcing penalties for evasion; and that quantities less than 5 cwt. shall be delivered without a ticket, but shall be weighed before delivery. By charters granted in 3 James I. and 12 James I., the Corporation possesses certain rights in respect to metage and lighterage of goods brought into the port of London: and by acts of Parliament passed in 1868, 1703, and 1830, certain dues were imposed upon all coals brought into the port of London—first, to pay for the rebuilding of London after the great fire; next for the aid of "orphans and other creditors of the City of London;" and next for making the approaches to new London Bridge. The act of 1831, after reciting these powers, enacts that the corporation shall be empowered to commute these rights for a duty of one shilling per ton; viz., four pence in respect to the chartered privileges, and eight pence in respect to the London Bridge Approaches Fund.—The duty payable on coals brought inland by the Grand Junction Canal was assimilated to the duty on coals brought coastwise. The corporation dues were made payable before the removal of any coals from the vessels to the wharfs. The coal fitter or vender must send to the clerk of the coal market, with every cargo of coals, a certificate, stating the date of shipment, the name and owner of the ship, the quantitity of coals, the collieries whence brought and the price paid for the coals; and the certificate so sent is to be registered at the coal market on the arrival of the ship.

In 1838 an act was passed (1 and 2 Vict. c. 101) which may be considered as subsidiary to the statute just noticed. By the act of 1831, most of the provisions were made for a period of seven years, to expire at the end of 1838; and by the act of 1838 these were, with a few exceptions, continued for a further period of seven years. Among the exceptions were the following:—The coal ticket is changed in form; a ticket is to be sent with coals in a lighter as well as in a wagon or cart; every coal-weighing machine is to be tested and marked at Guildhall; a drawback of all the city dues is made, under certain regulations, on coals which are exported from the port of London without having been landed. To protect the laborers often employed in unloading coal ships, it was enacted that all such persons should be paid their wages daily; and to prevent crowding and accident in the river, the corporation was empowered to make stringent regulations concerning the arrival, mooring and departure of the coal ships.

The coal laborers or coal whippers attracted sufficient attention to their condition and alleged hardships to obtain an act of Parliament in their favor in 1843 (6 and 7 Vict. c. 101). The following are the chief arrangements made by this statute:—A board of commissioners is to be appointed for registering and regulating the coal whippers. The board of trade is to appoint four of these commissioners, the corporation of London four more, and a ninth is to consist of the chairman for the time being of the General Ship Owners' Society of London. The commissioners are to open books of registry, under the care of a registrar: in which are to be entered the name, the age, and other particulars, of every coal whipper employed in the port of London; a small fee being paid at registry. A certificate given to the coal whipper at the time

of registry, is to be his passport and security in pursuance of his calling. No person is to act as a coal whipper unless registered, except the crews of colliers, and the servants or laborers of the owner or purchaser of the cargo. Offices and stations are to be provided by the corporation at the request of the commissioners. The commissioners are to provide all the requisite stages, planks, gins, baskets, shovels and tackle, for whipping or discharging coals from the vessels; the coal owner may use apparatus of his own; but if he borrow such, it can only be from the commissioners, and the hire is paid for at so much per cargo. The master of every laden coal ship is to send notice to the coal whippers' office, as to the place, the quantity, and the time of the coals to be discharged. The officers of the coal whippers' office, upon the receipt of this notice, are to hold a kind of auction among the gangs of coal whippers there assembled; and the gang which will take the work at the lowest price is selected, subject to the approval of the master of the vessel. If either the clerk of the office or the master of the ship neglects to carry out the arrangements, they are fined, as a security to the coal whippers. Upon the conclusion of this discharge, the master is to pay the wages to a person appointed by the commissioners; and this money is handed over to the coal whippers, with a deduction not exceeding a farthing in a shilling. For carrying out the purposes of the act, the expression "Port of London," is limited to the distance between London Bridge and Gravesend. A "gang" of coal whippers, who work together as partners, consists of nine men: and the trade of coal whipping is defined to mean "the discharging of coal from a vessel by raising the coal from the hold in a basket or box by manual labor only, with the aid of ropes and a pulley; and shall include not only the persons who so raise the coal, but also those who fill and empty the box so raised."

Another act was passed in 1845 (8 and 9 Vict. c. 101), the chief object of which was to extend the operation of the former acts to a further period of seventeen years; so that most of the powers given to the corporation in 1831, and extended seven years further in 1838, and now extended from 1845 to to 1862. One change effected has been a consequence of the opening of railways; it provides that all coals brought within twenty miles of London by *any* conveyance, shall pay the corporation dues.—Out of these dues, however, one penny per ton is to be transferred by the corporation to the commissioners of woods and forests, and by them applied as a fund for opening new streets and making similar improvements in the metropolis. Provision is made for compensation to land metres and other officers whose duties have been superseded since the old mode of managing the coal trade.

The coal whippers' statute, as we may term it, was only passed for thres years; it expired in '46; and another act was passed in that year (9 and 10 Vict., c. 36), extending the main provisions of the statute to 1851. A few alterations were made, but they were slight in character; their chief tendency is to lessen in a slight degree the stringency of the rules which prevent a master of a coal ship from unloading where and how he pleases. All the bye-laws made by the commissioners of coal whippers require the sanction of the board of trade.

Such being the chief enactments in force, we may now proceed to elucidate them by a few details.

The area of all the coal fields of Great Britain has been roughly estimated at 9,000 square miles. The produce is supposed to be about 32,000,000 tons annually, of which 10,000,000 are consumed in the iron works, 8,500,000 tons shipped coastwise, 2,500,000 tons exported to foreign countries, and 11,000,000 distributed inland for miscellaneous purposes. The exact declared values of the quantities exported in three recent years were—

1846	£971,174
1847	968,502
1848	1,096,356

The port of Newcastle ships nearly one-half of all the coals exported. France takes about two-thirds of all the coals exported from Great Britain. Of the eight-and-a-half million tons shipped annually from one port to another, about two-and-a-half millions are shipped from Newcastle alone. The number of collieries belonging to Newcastle and the Tyne is about 130; the fixed capital invested in them is supposed to amount to not much less than ten millions sterling; and the vend or sale is from six to seven million tons annually. The increase in the home vend, at the Tyne, between the years 1800 and 1845, was 212 per cent.; in the foreign vend, 1254 per cent.; and in the aggregate, or total vend, 270 per cent.

The coals sent to London in four consecutive years amounted to the following large quantities:

	Tons.
1843	2,663,114
1844	2,563,166
1845	3,463,630
1846	2,975,627

Of these quantities about eleven-twelfths are supplied by the three rivers, Tyne, Wear, and Tees. The Tyne alone supplies about two-fifths of the whole. The quantity brought to London by railway and canal is a very small fraction of the whole. The quantity brought by ship alone in 1848 was 3,418,340 tons, besides a small quantity by inland conveyance. The proportion of the entire product of the Northumberland and Durham colleries which is brought to London, is probably about one-third —andas there are about 35,000 persons employed in connection with these collieries, we may perhaps be justified in saying, that 12,000 persons are employed in the north in digging and shipping coals for London. Of all the coals brought to London, it is computed that about one-eighth part is required by the gas companies.

The Northumberland and Durham coal owners have certain arrangements among themselves, concerning the quantity and price of the coals forwarded to London; and the legislature has had much difficulty in breaking down or lessening the monopoly thus occasioned. After the coals have left the pit, they have to traverse rail or tramways —from a few yards to a dozen miles in length—to the banks of the Tyne (supposing this to be the river at which the coals are shipped.) Here they have to do with *fitters and keelmen.* Fitters, who used to be designated *hostmen*, are coal brokers or factors residing at Newcastle, they manage all the transactions between the coal owners on one hand, and ship owners or other purchasers on the other. The keelmen are laborers who bring the coals down the Tyne in short strong barges, and hoist them into the holds of the coal ships which are moored near Shields; but by means of *staiths* or stages erected at the banks of the river, in connexion with the colliery railways, coals are now more frequently precipitated at once into the vessels, without the aid of keelmen; and the ship, so laden, proceeds on her voyage to London.

Numerous indeed are the items which raise step by step the price of coals to a London consumer. In the year 1830, the port charges at Newcastle alone, for coals shipped to London, comprised no fewer than nine items—the Richmond Shilling, Scarberough Pier dues, Bridlington Pier dues, Whitby Pier dues, Trinity Lights, Low Harbour Lights, Private Lights, Tynemouth Light, and town dues. These were reduced in after years, principally by means of the abolition of the "Richmond Shilling." Then, arrived in the Thames, commenced the London dues. These at different periods have assumed the forms of orphan dues, metage dues, London Bridge dues, coal market dues, Coal Meters' Compensation dues, water bailage dues, groundage dues, permit fees, and registry fees. Many of these have been commuted from time to time in the modes pointed out in the abstracts of the statutes given in a former page. But the numerous Newcastle dues were smaller in am't than those of London, and bear a still less ratio at the present time. The "Richmond Shilling" was originally a grant made by the Hostmen's Company of Newcastle to Queen Elizabeth (in return for the privileges conceded by her), of one shilling per chaldron on all coals shipped from the Tyne. Charles the Second made over this grant to his children by Louisa Querouaille (afterwards Duchess of Portsmouth); whence has sprung the ducal house of Richmond. By the early part of the present century, this duty realized a very large amount; insomuch that the government commuted it for a perpetual annuity of £19,000 per year, payable to the Richmond family; in the purchase of which annuity the government expended more than half a million sterling! Although it is impossible to give a correct average, where the larger items are continually changing, we shall perhaps approach the truth in saying, that in the price paid for a cargo of good coals at the Coal Exchange of London (say at the present market price of about 18*s.* per ton). about 8*s.* is the value when the coals have reached the hold of the ship in the Tyne; 8*s.* for the the transit from the Tyne to the Thames; and 2*s.* for various Thames dues.

But to proceed with our account. The ships employed to bring coals to London amount to a large number. Three hundred years ago, the use of coal had only just commenced in the metropolis; wood having previously been used. Two or three ships were enough at first to furnish the supply. By the year 1615, the number had increased to 200; by 1700 to 600. In 1805 there were 4,856 cargoes; in 1820, 5,884; in 1830, 7,108; and in 1840, 9,132. In 1845 there were 2,695 ships, which brought 11,987 cargoes, containing 3,403,320 tons; and in 1848 there were 2,717 ships, which brought 12,267 cargoes, amounting to 3,488,310 tons. Taking the number of ships actually and regularly employed in bringing coals to London at 2,700, with eight men to a ship, which is about the average, this gives about 22,000 persons so employed. The freight from the Tyne to London, including the Tyne duties, varies from about 7*s.* to 11*s.* per ton, according to the state of the weather and the amount of competition. The average cargo of a coal ship is somewhat under 300 tons.

Arrived in the Thames, the laden coal ship passes through numerous official ordeals. There is first the registering in the city books, and the payment of the city dues and fees; there is the routine of arrangement whereby the coal factor or broker, whose place of business is at the Coal Exchange, effects a sale of the cargo to the coal merchants; and there are the singular regulations concerning the discharging or *whipping* of the coals from the

ship into the barges of the merchant who has bought the cargo. The corporation arrangements are sufficiently illustrated by an abstract of the several acts of Parliament—the Coal Exchange arrangements deserve a little further elucidation.

The coal factors of London, acting in conjunction with the coal owners of the north, agree among themselves as to the number of cargoes which they will offer for sale on any one market day. This is to depend partly on the number of ships which enter the Thames between one market day and another, and partly on the market price of coals. They press the coals for sale only in certain quantities, in order to prevent the price from descending below a certain point. On the other hand, the corporation, to prevent these regulations from becoming too close a monopoly, acts on a specified set of bye-laws, so that the ultimate price to the consumer is the result of a balance between many conflicting agencies. Sometimes there have been 400 cargoes of coal in the Thames at one time, waiting for their turn to be sold according to the arrangements among the factors. There is a coal factor's office at Gravesend, and a coal trade office at Newcastle; and there is such a constant correspondence between these two offices and the coal factors of London, that the exact state of the market at both ends of the route is known at all times to those concerned.

In a Parliamentary report of 1836, the following account of the dealings at the old coal exchange was given: "There are three market days, Mondays, Wednesdays and Fridays, continued as before, though not required by statute, and the hours to sell and buy are from 12 to 2½ o'clock, as by the former act of Parliament. Every factor has a list setting forth the sorts of coal he has for sale on the Coal Exchange every market day; and when a cargo is sold, an agreement is entered into with the buyer, the price and conditions of payment being stated in detail, and the buyer agrees to pay 1½ pence a ton for half metage. All sales are private sales. The merchants may buy at all hours; but the factor will not enter his purchase on that day if it should be made after 2½ o'clock; after that hour, say on Monday, any person may buy for the next market day to deliver on Wednesday; but no factor will sell to deliver on Tuesday, as that would be against the regulations; and the factors will not take the consignment of coals, unless the owner complies with their rules and regulations; that is, to have their cargoes sold in rotation. Factors are paid by a commission of one-half per cent. on the amount of sale, and 3d. per ton factorage; and they take the risk of the merchants for payment." These regulations have been continued with but little change ever since; it is possible that a few modifications and improvements may be introduced in the arrangement of the new building. The old Coal Exchange belonged to private individuals till 1807, when the corporation purchased it, to make it an open coal market. It was in 1845 that the leading firms in the coal trade petitioned the corporation to build a new Coal Exchange. The corporation assented; Mr. Bunning, the city clerk of the works, was commissioned to make plans and drawings; and the remarkable building just finished is the result.

To be continued.

Virginia and Tennessee Railroad.

We have received the second annual report of the directors of this important work. Since the last report the line from Lynchburgh to Salem, a distance of 61 miles, has been placed under contract, and immediate measures are about to be taken to complete a working survey of the whole line from Salem to the Tennessee State line.

A sufficient amount has been subscribed by individuals to entitle the company to the State subscription, and there now appears to be no obstacle to the vigorous prosecution of the work.

Our readers will be happy to hear such favorable accounts of the progress of this great enterprise. We hardly know of another road in the country to which so much interest attaches. It is to open to us the most interesting and attractive portion of the Union, which has hitherto been almost secluded from public attention; a section, the richest in its resources, but which still remains undeveloped for the want of suitable means of intercommunication. This road is to supply the only condition wanting to the most rapid developement of this section of Virginia. On the completion of the connecting links it is to form a part of the great railroad line between the north and south.

We have copied largely from the report of the President, Gen. O. G. Clay, and the Chief Engineer, C.F.M.Garnett, Esq., for the purpose of showing the influence that this road, though just commenced, is already exciting upon the public mind of that State in reference to turning a portion of its labor now entirely engaged in agricultural into other pursuits. The whole matter is so well stated in the report, that we prefer to transfer a portion of it into our paper for the purpose of giving to our readers a specimen of the manner in which they are beginning to reason in Virginia.

The following is from the report of the President:—

Being aware that the company will soon have to make a heavy expenditure of money, for the article of iron, necessary to the completion of their improvement, and looking to all the elements that enter the price and value of iron, when delivered in Lynchburg, the board are of the opinion that it might be sound policy, and true economy, for the company to manufacture the rails for the road by their own means, should it appear that it might be done on better terms than it could be procured otherwise.

There are many strong reasons for this course. The superior value of American iron and the moderate cost, are sufficient reasons; even if the cost would be somewhat greater, there would still be cogent reasons in favor of the undertaking. This is eminently a Virginia work, and to promote the prosperity and develope the resources of the State Virginia will subscribe more than half the capital stock. The very object which induced the Legislature to subscribe to the stock, is more effectually obtained by making use of the coal and iron of Virginia, and the industry of her citizens to make the rails for the road. The furnaces of Rockbridge, Botetourt and Alleghany, can now supply the pig metal at less than the prices estimated. By this plan, more than one million of dollars will be expended among our own people, instead of being sent abroad to swell the prosperity of strangers and foreigners.

The following estimates carefully prepared, will settle the question of costs:

Cost of Manufacturing Railroad Iron at Lynchburg.

1½ ton of pig iron to the ton of rails at $22 50 per ton	$28 13
60 bushels of coal, at 13 cents	7 80
Workmen's wages	9 50
Working manager's wages	25
Clerk's wages and office charges	13
Forge repairs	1 00
Interest on capital invested in erecting rolling mills	50
Total cost of manufacture	$47 31

This estimate is predicated upon the supposition that 5000 tons of rails are produced annually, and the price of pig iron here, as assumed, is in accordance with its present value.

Cost of English Railroad Iron delivered at Lynchburg.

Cost at Richmond	$41 50
As the English iron must be paid for in cash on delivery, it is proper to charge three months' interest on first cost	63
Cartage from vessel to canal boat	70
Freight to Lynchburg	1 00
Canal tolls per ton of 2,240 lbs	4 08
Total cost at Lynchburg	$47 91
To this should be added for difference in quality of American and English iron	8 00
	$55 91
Making a difference in favor of American iron of	$8 60

which, upon the quantity required for your road, say 22,100 tons, would be $190,060.

Should the iron be purchased of American manufacturers, delivered at Richmond, the cost, when placed in the depot at Lynchburg, would be as follows:

Contract price at Richmond	$55 00
Cost of transportation to Lynchburg	5 08
	$60 08

The contract price here assumed is $5 per ton less than the rolling mills at Richmond are now manufacturing T rails for the Richmond and Danville railroad company.

The quantity required for the line of your road, is 22,100 tons.

If manufactured by this company, it will cost	$1,045,551
If English iron be purchased at present rates, and no *allowance* be made for difference in quality, the cost will be	1,058,811
Difference in favor of American iron	$13,260

If the usual allowance of $8 per ton, for superiority of American iron, be made, this result will be varied thus:

Add to the price of English iron as shown above, $176,800, making its value	$1,235,611
Take from this cost of manuracturing at the company's own works, say	1,045,551
Real saving to the company	190,060
If the iron be purchased of American manufacturers, the cost, when delivered ($68 08) will be	1,327,768
Take from this cost of manufacturing, at company's own works	1,045,551
Gain by manufacturing	$282,217

From the results shown by these statements, it would seem to be sound policy for the stockholders to authorise the board of directors to build a rolling mill, to manufacture the railroad iron required in the construction of their road.

Apart from the question of economy, in the construction of your road, there are other considerations, which sustain the propriety of such an expenditure as will be required, if this plan be adopted. All must perceive, that, after the road shall have been built, this company will require a large amount of malleable iron, in the construction and repairs of the machinery of the road. The locomotive engines, passenger and burthen cars, should all be built, either in the shops of the company, or in those of individuals who may erect such works on the line of the road. The necessity for this is the greater, because our road will be, for a long time, at least, unconnected with any line of railway leading to places where such articles can be procured: thus incurring great delay and a heavy cost for transportation.

The question arises: will individuals embark in this business, if they have to look elsewhere for malleable iron, out of which these articles are, to a great extent, fabricated? It is thought not, and the experience of the country sustains the opinion, for we do not learn that any such establishments have been put up on the line of railroads not contiguous to works producing malleable iron.

But there is another view to which the attention

of the stockholders is invited. It is the influence which the manufacture of your rails would have in promptly demonstrating the value of the coal and iron deposits, existing on the line of your road, but which are now of no use to the country. For the manufacture of your rails, you will require annually, for the next four years, 6,225 tons of pig iron and 300,000 bushels of bituminous coal.—When the road reaches Montgomery, it will be on the confines of the coal formation, and in a country abundantly supplied with the richest iron ores. By adopting the plan now suggested, these valuable minerals will at once invite the capital and industry of the enterprising people of that region, because the company itself will become a large consumer of these articles, and thus perform the double office of carrier and consumer.

It may be urged that, if the company should not erect works for manufacturing the rails required in the construction of its road, individuals would, and thus the development of the mineral resources of the country be as certainly secured. Such a result cannot reasonably be expected in the present state of the iron trade, and should the company direct the board of directors to *purchase* American iron, the cost of the improvement would be greatly enhanced thereby. What this enhancement would be has been shown in the preceding statements.

If a contract *could* be made with individuals to manufacture your iron *on the line of the road*, at fifty-five dollars per ton, the difference would then be $169,949 against the company; but if it be manufactured at Richmond, at a cost of $55 per ton, and you then add to that the charges of transportation, the enhancement of cost, over what it will stand the company, at their own works, will be $282,217.

The following is from the report of the Chief Engineer:—

If Virginia expects to prosper, a portion of her capital and industry should now be directed to manufactures. While railroads are being constructed to facilitate exchange of the various articles of commerce and intercourse of persons—to collect at favorable points the raw material and food required—manufactures should keep pace with them. In this way alone can the rescources of the country reach their fullest development, and industry obtain its highest reward. When agriculture and commerce are stimulated by cheap transportation, and a consequent increase of population ensues, there must be new channels of industry opened to employ this increase of population. The growth of cities, especially, depends upon a proper regard being paid to manufactures. And surely Virginia now offers a field for this application of capital which might satisfy the most cautious.

The imports of the United States, for the year ending June 30th, 1848, were $154,997,928, and as the population is now about 20,000,000, we have $7.75 per capita, as the amount of imports consumed by the citizens of the United States. It is very certain that Virginia consumes more than this average of the products of other States and of foreign countries. States chiefly agricultural, as Virginia is, must necessarily make larger importations in proportion to population, than those in which manufactures flourish. The amount of foreign merchandise, consumed in the island of Cuba, is between $40 and $50 per capita.

When we reflect that the commonest articles of every day use are now imported from the North—even the brooms, axe-helves and wooden buckets, sold in all the stores of Lynchburg, are manufactured in New England—some idea may be formed of the amount of money sent out of Virginia annually, to build up cities beyond her borders. An enmeration of the infinite variety of things made in the Northern States and brought here for sale, would make a curious catalogue. The very pen with which this remark is written and all the machinery to be used in publishing it, are imported. It would not be extravagant to assume that the importation per capita of Virginia was three times that of the average of the whole Union. But, we will put it down as only $10 for each inhabitant.

The population of the State is about 1,300,000, which would give $13,000,000 as the sum now annually sent abroad, by our people for articles which might be made at home. But, to avoid all risk of the charge of exaggerating the importance of this subject, let us reduce this estimate to $10,000,000. But the truth of this result may be tested by another mode of reasoning. The estimated value of the whole product of Virginia is $70,000,000. Can any man doubt that Virginia pays *more than* one seventh of her gross production for the fabrics of other States and foreign lands. Is not this enough to encourage the capitalist, to embark his money in such establishments in our State? And yet, even this heavy demand will increase with the supply. Every mile of railroad finished, every acre subjected to the plough, every wheel turned for the conversion of raw material into fabrics, will increase the consumption of manufactured articles.

The difference, in enterprise, between the Northern people and Virginians, may be seen most strikingly in the readiness with which the former avail themselves of natural advantages. A railroad was made across the Connecticut river, at a point where there was a considerable fall in the stream, and immediately a company was organised with a capital of $4,000,000, to dam the river, build a town and erect manufactories. This has been done within some two or three years. The dam 30 feet high, has been finished, a great many houses have been built, they are now erecting the largest hotel in New England, and the town of Hadley now numbers 5000 inhabitants. One man in the neighbourhood has refused $100,000 for 40 acres of land, which two years ago, would not have commanded $5000.

There is a dam, erected by the James River and Kanawha Canal Company, and a water-power nearly equal to that at Hadley, within five miles of Lynchburg, and so little attention does it attract from the citizens of the town, that one would scarcely think that they regarded it as more than a object of idle curiosity.

Why is this difference? It is not liberality that induces the Northern capitalist to invest his money in railroads and manufactories. It is *enlightened educated selfishness.* They have tried the experiment and they know that enterprises of this nature will bring wealth to themselves while they secure general prosperity to the country. With them the man who is most desirous to receive a large interest on his money, is the first to engage in works of internal improvement and manufactures. What else, but this spirit of enterprise, directed in these profitable channels, has built up the magnificent fortunes of those merchant princes of Boston?

There is, at this moment, a field open in Virginia for the profitable investment of capital, such as no other part of the Union presents. With her great coal fields and rich beds of iron ore, with her boundless water power, and favorable climate & soil for the production of food, snd with her home demand of $10,000,000 worth, annually, of manufactures, Virginia may compete with any people in the markets of the world.

While railroads thus create, in a country, the absolute necessity for manufactures and render them profitable by the facilities they afford, the reaction is no less beneficial to the railroads. It is a source of large profit to the roads to convey the raw material and food to the factories and carry the articles fabricated to market. Moreover a dense population cannot exist without manufactures, and consequently, agriculture itself, as well as every other branch of industry, cannot reach its highest development without them.

Hence it becomes a matter of the very first importance, for a railroad company to encourage every species of manufacture at their termini, and along their line, during the progress of the work. Every enterprise of this sort will make itself felt in the future dividends on the stock of the road. The profits of the road will increase with the improvement of the country, in all the important applications of labor and capital. It is, therefore, submitted to the board, as a question for serious deliberation, how far they may, by their own action, based on principles of strict self-interest, extend a liberal encouragement to the manufacture of every thing required for the completion of the road, in our own state.

We really believe that this road is to be the *Moses*, which is to lead Virginia out of Egypt into a better land. By common agreement, the test of the prosperity of a State is the degree of its wealth and population; and that of the superior character of its people compared with others, is the energy and industry by which the resources they possess, are made available to the wants of life. With these tests how stands the account between Massachusetts and Virginia? In natural advantages, Massachusetts is superior to Virginia in no one particular. As far as these are concerned, the former is the poorest State in the Union. She is poor in soil, poor in mineral wealth, and possesses a most disagreeable climate. She has commercial advantages, but not to be compared to those of Virginia. This latter State on the contrary is most oppulent in every natural resource, in a fertile soil, in inexhaustible mines of iron and coal, in a most genial climate, and is penetrated deep into her interior by magnificent estuaries, presenting greater commercial facilities than can be found in any other State in the Union. What results do we witness on looking at both? Virginia has an area of about 70,000 square miles and Massachusetts of 7,000. The population of the former is not far from 1,300,000, and of the latter, 900,000, making 18 inhabitants to the square mile in one and 128 in the other. How is it with the wealth of the two?—Massachusetts has now expended not far from $75,000,000 upon her own, and on other New England railroads, and this is but a fraction to what is invested in her commerce and manufactures. She possesses capital equal to any task to which she sets herself down to accomplish. Her rich men have but to will, and large and flourishing towns spring into existence as if by enchantment. With her every branch of industry is prosperous, agriculture is stimulated to the highest degree by the great demand created by her numerous manufacturing towns. The most sterile portions of her soil are worth more than five times as much as the most fertile land of Virginia, and unless there is speedily some change in the policy of the two, Massachusetts with her 7,000 square miles, will soon number more inhabitants than Virginia with her 70,000.

Such is the present comparative condition of these States. We ask any Virginian whether, taking the natural advantages of the two, with the same industry and energy, and by pursuing a similar policy, the reverse of the picture we have drawn, would not have been presented? The first step toward a change of this picture has already been taken. The cause of this wide difference is already felt and admitted, and the true course to be pursued is pointed out in the extracts we have given. Virginia must give up her metaphysics, her political speculations, her traditions, the memory of her former greatness and influence, the food upon which she has for a long time lived, and catch something of the genius of the present age, which consists in the actual, in doing. While one section of the country have been training the lightening and adapting the steam power to minister to all the arts of life, Virginia and the south have been discussing questions of constitutional right, or endeavoring to decipher the opinion of some departed saint in their political calender, upon some question which ceased, perhaps, to have any significance 50 years since. All constitutions exist only in the future, and all law is to be the expression of popular will for the time being. The south has been "the dead burying the dead." Let it arise, and shake off the lethargy which has so long bound it. Let it commence making iron and cloth, steam boats and the steam engine. This will develope

their resources, and not only make them prolific, but will attract the immense tide of foreigners, who now exclusively settle down in the north.—Soch a policy will give the south what she once possessed, a preponderence in the population of the country, and we shall hear no more of the necessity of defending their rights from northern aggression; for they, from the force that will be developed within them, will become the aggressors. The sceptre of dominion in this country will never be held accidentally. It will always remain in the hands of those who, by their superior mental and physical characteristics, are entitled to wield it.—The vast progress that has been made in the physical sciences within 20 years, has entirely changed the old order of things. So potent are the new influences at work, that those who have availed themselves of all these new agencies are as far in advance of those who have not as the latter class, are in advance of what society was hundreds of years ago. Those States or countries that wish to maintain their position, must continue to take the lead in appropriating to their use all the aids that science and discovery are multiplying with such wonderful rapidity.

Engineering.

We have obtained permission from A. C. Morton, Esq., Chief Engineer of the Atlantic and St. Lawrence railroad, to publish the specifications annexed to the contracts, pointing out the manner of grading or forming the road-bed of that road as far as constructed. The *practical* value of this specification will be fully appreciated by the younger men of the engineering profession, and it willl serve as a valuable text to all men engaged in railroad construction.

We invite the attention of engineers to this department of the Journal, and ask of them to give through its pages the practical results of their experience:

Specification of the manner of grading or forming the road-bed of the Atlantic and St. Lawrence Railroad:

The ground occupied by and set apart for the railroad is to be cleared for a space of three rods on each side of the centre line, of all trees, stumps bushes, logs, rubbish and vegetable matter; the trees, stumps and bushes to be cut close to the surface of the ground and the whole to be removed ordestroyed by burning or otherwise as the engineer shall direct.

When embankments are less than four feet high, all the large stumps, large roots and other vegetable matter must be thoroughly grubbed out and removed, or destroyed as specified above. All valuable timber within the limits of the roadway to be cut into such lengths as the engineer shall designate and piled up in convenient heaps and in such manner as to preserve it from decay.

Where the road is graded for a single track it will generally be fifteen feet wide on the embankments, and twenty-two feet wide at the foot of the slopes in excavations. The side ditches are included in the last mentioned width, and will usually be five feet wide at the surface of the road-bed and 1½ feet deep.

Where the road is graded for a double track, the road-bed will have a surface width on embankment of twenty-six feet, and in excavation thirty-four feet, the side drains being generally for the same dimensions as above stated. The slopes of the excavation and embankments will usually be one and a half feet base to one foot rise.

In rock cutting they will not vary much from four inches horizontal to one foot vertical.

Such variation in the width of the excavations and embankments, the slopes and dimensions of the side drains to be made as the engineer shall from time to time direct.

When the excavations are in clay or other materials unsuitable for the road-bed, the contractor shall excavate to such depth below grade as the engineer shall direct, and if there is any good gravel or other suitable material, on or near his work not likely to be affected by frost, the same shall be placed on the road-bed, covering the whole surface between the side drains to a depth not exceeding two feet. Clay embankments are in like manner to be covered with gravel of a sufficient depth to guard against the action of frosts.

When embankments are formed by carting they shall if required be made in layers not exceeding four feet in thickness, and in all cases the slopes of the banks shall be made full in the first instance and carried up faster than the centre, and all vegetable or loose earth which shall be unsuitable for embankments shall be removed; and no stumps, logs or other perishable material shall be placed in the embankments.

All embankments which are carried up to grade with materials taken from cuts, must be entirely free from stone to a depth at least of two feet below grade and the best materials must be reserved for dressing off the surface.

Between the foot of the slopes of the embankments and the side drains there shall be a space or berm of such width as the engineer may direct.—All the earth excavated from road-bed is to be carried into embankments unless otherwise directed by the engineer. The surplus material, if any, to form double track embankment, and where there may be a deficiency of material to form the embankments, the excavations for road-bed will be made for a double track, or the earth procured from side cuts at such points and transported such distances as the Engineer may direct. The surplus earth from excavations which cannot be carried into embankments shall be deposited in a regular manner on either side of the excavation, with such slopes as the engineer shall direct, and so arranged as to convey the drainage or fallen water from the road, leaving a space or berm of not less than fifteen feet in width between the same and the outside line of excavation. The space of berm so left to be excavated in such a manner, and such drains cut as to direct the water which may collect upon it from the railroad. In all plaees where spoil banks or banks for diverting the drainage water from the railroad are formed, the trees, if any, are to be cut down and removed or destroyed.

Every description of material required o1 be removed and raised in forming the road-bed, is to be estimated as excavation, and the quantity ascertained by measuring either the excavation or embankment as the engineer may determine, and making such allowance in measuring embankments for shrinkage as he shall deem proper.

The earth and rock are to be raised and deposited within a distance not exceeding 500 feet, for the price stipulated for excavation. For removing earth and rock each additional 100 feet, the contractor will be paid in accordance with his price for haul.

The embankments and excavations required for road and farm crossings, bridges and changing the channels and beds of streams, shall be of such dimensions and slopes as the engineer shall prescribe, and the price for all such excavations and embankments shall be the same per yard, as for similar work in the road-bed on the section to which this work may belong.

The various kinds of excavations to be classified according to the judgment of the engineer under the head of earth or rock. The earth to be classed as said engineer in his judgment shall think proper, under one of two heads and contracted and paid for as such, to wit: common or ordinary earth; 2nd, indurated or cemented clay, sand or gravel, separate or combined.

All rock which may be excavated will be ranked under two heads, to wit: loose rock or solid rock, and paid for as such.

Loose rock covers all stones measuring over one cubic foot and not exceeding four cubic yards, and before estimated must be piled into heaps convenient for measuring.

Solid rock comprises all rock in place which requires blasting, and all detached stones or isolated masses measuring over four cubic yards.

Where suitable material for slope wall or masonry can be obtained from the rock excavations, the same shall be deposited in some accessible place from which it can be removed and used for the purpose designed.

Where upright supporting walls are required, for the protection or support of embankments or at the foot of slopes in cuts, they will vary in dimensions and slopes according to circumstances, and will be sunk in such depth as is necessary to secure a solid and permanent foundation. The stone used in the walls must be of a firm and durable character, well shaped and of sufficient size to insure stability. These walls must be constructed as to form a complete bond throughout their entire thickness, the beds of the stones being laid at right angles with the battered face and the whole neatly coped with flat stones, two feet wide and three feet long.

Slope walls will be of such thickness as the engineer may direct. The slope being nearly the same as that of the embankments.

Where these walls are founded in deep water, *rip rap foundations* will be made of large stone and brush laid in alternate courses so as to form a bond.

Refuse stone and other coarse materials found in the excavations shall be placed in the outside of the embankments and next the walls; and all stone embankments deemed by the engineer necessary to protect the wall and banks shall be made by the contractor.

Public or private roads which intersect the line of the railroad shall not be obstructed by excavation or otherwise until direction shall be given by the engineer for completing the road across the same; nor shall any crops or vegetables or fruit trees or buildings of any description or fences be disturbed unless by the direction of the engineer.

Changes in the position of the road with a view to perfecting the alignment of the same by straightening or giving more ease and symmetry to the curves, together with variations in the grade line, may be made by the engineer, and no extra allowance shall be claimed therefor.

Before the road is considered finished the excavations and embankments must be neatly trimmed, and the whole surface made to conform accurately to the slope stakes and the plane of graduation.

The culverts on the road will be of two kinds.—The square or box culverts will be of dry rubble-masonry—they will be from two to four feet span, and from two to five feet high—the thickness of the walls varying according to circumstances—the stones of which they are built must be strong, durable and well shaped. and laid in such a manner as to form a perfect bond throughout. They will be covered with large flat stones lapping not less than one foot upon each side wall, and being from nine to eighteen inches thick, as the engineer shall deem necessary, fitting together so that the embankment shall not run through the culvert. The foundations will be paved with flat stones set edgewise, in regular courses across the culvert, to be not less than twelve inches in depth; and after the pavement is completed, it shall be thoroughly rammed down with heavy beetles, and the interstices well filled in with gravel. When required a course of water tight sheet piling shall be placed across the culvert at each end, extending not less than three feet below the bottom of the paving to prevent undermining. The end walls of these culverts will be of hammer dressed masonry, with a regular coping two and a half feet wide and not less than six inches thick, projecting three inches over the general surface of the wall, laid in full mortar and pointed.

The arched culverts will be of not less than six feet span. Where the foundation is not rock, they will be built on a pavement similar to that described above—or if the engineer deems it necessary, upon timbers hewn on two sides, and laid two feet from centre to centre crosswise of the culvert. The timbers when hewn, must be eight inches thick, and the spaces between them filled with gravel well rammed. Their upper surfaces will be covered with three inch plank, laid lengthwise of the culvert, well spiked or pinned, and the ends must be secured with sheet piling as in the box culverts.—When the foundatrons are upon soft ground, piles are to be driven and capped with timber, upon which a course of 3 inch plank is to be spiked.—The spaces between the piles and also the cap tim-

bers to be filled with gravel and well rammed down.

The dimensions of the arch stone to be such as to extend through the thickness of the arch, to be placed perpendicular to the curve of the same, and to be well and closely fitted.

The outer or ring stone of the arch to be equal in length and as nearly uniform in thickness as possible and to be *plain dressed* either with a Lush hammer or chisel, and to be well bonded with the contiguous arch stone, breaking joints at least 8 inches.

The wing and end walls of the arch culverts are to be formed of the larger and better shaped stone, hammer dressed on their exterior faces, and pointed with cement, and both are to be surmounted by a coping of broad stone of a thickness specified in the plan. The coping stone to be handsomely hammer dressed and brought as near to a uniform thickness as possible, and placed firmly and securely upon the walls in a bed of cement. The coping and ring stone as also the arch and cap stone to be included in the estimate with other masonry, without extra charge, The abutment walls when laid dry must be of large and good shaped stone, well dressed and laid so as to form a perfect bond having good beds and joints.

When the abutment walls are laid in cement they must be of good rubble masonry and built of strong durable stone, of good shape, well bonded, laid in full mortar, made of the best hydraulic cement, and clean sharp sand thoroughly mixed upon a platform of boards in such proportions as directed by the engineer, and applied to the work within the proper time for rendering the adhesion and solidification most perfect. The vertical joints will be grouted, and the grout must be made of cement and sand, first formed into well tempered mortar, and then reduced in a box to the proper consistency for running freely by admixture of water.

Cattle guards and passages will consist of two walls of dry rubble masonry of a substantial character placed from 4 to 6 feet apart, and coped for the reception of a sill on the top of each wall.—Where these are designed to pass the water of side drains of common roads, or the drainage of adjoining fields, the same foundations will be adopted as for culverts

When these passes are constructed of wood, they will consist of two bents placed at the requisite distance apart, and faced with three inch plank. The bents will be retained in their proper position by cross timbers substantially framed on the sills and cap pieces.

The abutments of bridges for passing the ordinary roads of the county over or under the railroad are generally to be of good rubble masonry, laid dry, and in a substantial and workmanlike manner. The stone to be large and of good shape and quality, and to be well bonded throughout. At points where from the position of the bridge or the nature of the ground a better description of masonry is requisite, it will conform to the masonry required for large bridge abutments.

The masonry of bridge abutments and piers will be hammer dressed beds and joints with rough faces, or what is termed *rock work*,, having an arris of one inch cut around the face of each stone, and laid dry or in cement as the engineer shall direct. The ends of the piers will usually be triangular shaped, and for the up stream ends the faces of the stone shall be dressed smooth, having the requisite batter to form ice breakers when laid. The stones used must be of large size, laid in courses of not less than 12 inches thickness in such manner as to be well bonded throughout, by a system of alternate headers and stretchers. The headers must be at least four feet long. The stretchers in the face must have at least eighteen inches bed, and at least six inches more bed than face, and the backing stones must have as much bed as face. The coping stones of the abutments and those on which the superstructure rests must be dressed smooth, and laid in full mortar.

The foundations will be of such description as the character of the ground and the work require, and may in some localities consist of piles driven in the manner indicated by the plan, and the spaces filled in with layers of concrete, or if the engineer deems proper, the heads of the piles will be dressed off and timbers framed on to them upon which one or two courses of plank will be firmly spiked.

Where piles are not required, timber and plank foundations will be adopted, the materials being of such dimensions and laid in such form as may be thought necessary to insure a firm and uniform bearing.

The foundations for the abutments of small bridges will, when the character of the ground admits, be formed of paving in the same manner as for culverts.

The proportions and dimensions of the several parts of the culverts, bridge abutments, and other mechanical works will be represented in the plans.

No masonry shall be laid in mortar (unless by special direction) between the first of October and the first of April.

All materials intended to be used in culverts and bridges, must be examined and approved by the engineer—and those considered by him unsuitable, must be immediately removed to such distance as he shall deem necessary, in order to prevent them from being used in the work.

The whole to be executed in a substantial, faithful and workmanlike manner, subject to the constant supervision and inspection of the engineer, who shall give such direction from time to time, additional and explanatory to the above specification, as occasion may require.

It must be explained that this document is intended to make the contractors acquainted with the general details required. The detailed specification of the work are of course placed in the form of a definite agreement, or supplied from time to time by the engineer as the work progresses.

In order to secure the faithful execution of the work, the following conditions are inserted in the contract:

It is also agreed that if any work shall be done by said contractor which is not included in this contract, the price and value of said work shall be determined by the Engineer. And it is likewise agreed, that the said work, during its progress, shall be subject to the supervision and inspection of said engineer, and shall be made to conform in every respect to his directions, and all bad or imperfect work to be immediately remedied, and the same rendered good and substantial, to the satisfaction of said engineer.

And it is further mutually agreed, with a view of preventing all disputes and misunderstandings, and for the speedy adjustment of such as may occur, that the engineer aforesaid shall determine the amount or quantity of the several kinds of work herein contracted to be done, and shall decide every question which can or may arise relating to the execution of the work under this contract on the part of said contractor, and his decision shall be final and conclusive.

And it is hereby further agreed, that, if the said contractor shall, in the opinion of the engineer, refuse or unreasonably neglect to remedy any imperfection which may be pointed out by said engineer, or in any manner violate the conditions of this contract, so that, in the judgment of said engineer, there shall be reasonable apprehension that the same will not be completed in the manner and within the time specified; then the engineer shall have the power, and it shall be his duty, to declare and pronounce this contract void and of no effect, and the said company may enter into a new contract with any other person or persons for the execution and final completion of the same.

And it is further agreed, by and between the parties to this contract, that in case any difference of opinion shall arise between the parties hereto, as to the construction of this contract, and the true intent and meaning thereof, and of the parties in forming the same, that such difference shall be considered and decided by said engineer; and the said parties do hereby submit all and singular the premises to his award, arbitrament and decision, and agree that the same shall be final and conclusive between them, to all intents and purposes

Illinois.

Rock Island and La Salle Railroad.—The committee to collect subscriptions for this road have succeeded in getting all the stock taken!—or $299,900 of the three hundred thousand required.

The expense of building the road has generally been estimated at $10,000 per mile, but it is thought that it can be constructed for an average less than $8,000 per mile—the cost of the Galena road 25 miles out, having cost $6,000 per mile. So level is the ground between Rock Island and Peru, that the greatest ascent per mile does not exceed fifteen feet, and generally ranges at from four to five feet. It is presumed that the company will be organized and the first instalment be levied, during the latter part of the ensuing month, and the work commenced in the spring.—*Chicago Democrat.*

Railroad Organization.—We understand that the Directors of the Alton and Sangamon Railroad Company have made choice of the following officers viz:

HENRY A. COIT, Esq., *President.*
E. MARSH, Esq., *Treasurer.*
ISAAC GIBBON, Esq., *Secretary.*
J. J. SHIPMAN, Esq., *Chief Engineer.*
C. F. JONES, Esq., *Resident Engineer.*

These gentlemen are now actively engaged in making the necessary preparations for the immediate commencement of the work; which, we doubt not, will be prosecuted to completion with all the expedition which skill and energy can effect.

Fox River Valley Railroad.—We are informed that efforts are making to extend the railroad from Aurora, down the valley of Fox, to Ottawa.

This will be another link, and a very important one too, in the great chain which is to connect Chicago with Galena, Cairo, Alton, St. Louis, and the flourishing towns and rich country of central Illinois.

The valley of the Fox is perhaps the richest agricultural and manufacturing portion of the State. There are a host of independent farmers on the banks of the river, a large number of extensive manufactories of flour, woolen goods, paper and implements of husbandry of all kinds; and a number of flourishing towns.

All of these interests, when combined and acting in concert with a determination to accomplish the objects are abundantly able to furnish the capital necessary to insure the completion of the road.

Competent engineers, familiar with topography of the country, and who have made surveys of the river for other purposes, say that the route is favorable, with easy grades, at an average cost per mile of the other roads in the State, that there will be very little difficulty, either in grade or expense, in getting in or out of the valley of the Illinois, or of crossing that river. The distance is about forty miles.

Geneva and St. Charles Railroad.—A meeting of the citizens of Geneva, Kane county, was held on the 16th inst., for the purpose of taking into consideration the expediency of constructing a railroad from that place to St. Charles. A committee had previously been appointed to confer with the directors of the St. Charles Branch Road, and their report was received. The proposals made by said Directors were considered favorable, and were acted on by the meeting. It was resolved to build a road, provided enough stock can be raised. Committees were appointed to secure the right of way, and to obtain the requisite amount of stock.

Lumber trade of Chicago.—An estimate is now being made from the books of the various lumber merchants, which is nearly completed, by which it appears that the enormous amount of 65,000,000 feet of lumber has been received in this city the past season.

The amount of lumber received in St. Louis last season was but 37,588,631 feet. This will give some idea of the immense business that Chicago does in one article of commerce.—*Chicago Democrat.*

The Lakes.

The entire line of Lake coast is 2000 miles. The following is the result of the survey of the United States Topographical Engineers.

Lake Champlain 150 miles, greatest width 12, average width 8; Lake Ontario 180, greatest width 51, average width 40; Lake Erie 240, greatest

width 57, average width 37; Lake St. Clair 18 greatest width 25, average width 18; Lake Huron 270, greatest width (not including the extensive bay of Georgian, itself 120 miles long, averaging 45 miles in width) 150, average width 70; Lake Michigan 340, average width 58; Lake Superior 420, greatest width 135, average width 100. These lakes may be considered as connected throughout their whole extent. Lake Champlain connects with Lake Ontario by means of the river Richelieu, the lock and dam navigation of St Lawrence river, Ottowa river, the Rideau canal throughout Canada, and the Champlain and Erie canals of New York. Lake Ontario is connected with Lake Erie, by the deep and navigable strait of Detroit, twenty-five miles long. Lake St. Clair is connected with Lake Huron by the navigable strait of St. Clair, thirty-two miles long. Lake Huron is connected with Lake Michigan, by the deep and wide strait of St Mary's forty-nine miles long.

Admission of New States.

We find in the New Orleans Picayune a particular account of the admission of each new State, since the establishment of our national independence. Vermont was the first. She was received in 1791. No constitution was submitted to Congress, or inquired for by that body. In fact the permanent constitution of the new State was not made until 1793. Kentucky came next. Her territory once belonged to Virginia, but was detached by act of the Legislature of Virginia in 1789. In 1791 an act of Congress directed that Kentucky should on the first day of Jnne, 1792, "be received and admitted into the Union as a new and entire member of the United States of America." The State constitution was not framed when the act of admission was passed.

The third State was Tennessee, formed out of territory ceded by North Carolina to the United States on condition that it should become a State. The people of the territory framed a constitution in 1796, submitted it to Congress, and the State was admitted. This was the first State constitution ever submitted to Congress with an application for admission.

Ohio was the fourth of the new States—"the first, (says the Picayune) formed of territory to which boundaries were affixed and previous governments assigned by the exclusive authority of the United States." It constituted the Eastern District of the North Western Territory, to all of which the ordinance of 1787 applied. The act of admission, which was passed in 1803, recites that the people of the Eastern District of the North West Territory had formed for themselves a constitution and State government, "*whereby* the said State had become one of the United States." This phraseology is noted as peculiar.

Louisiana, Indiana, Mississippi, Illinois and Alabama were admitted severally in the order named, and in the case of each there was a previous act of Congress authorising the calling of a convention to organize a State government.

Maine, originally a part of Massachusetts, came in as the tenth new State. It appears that there was no action of Congress previously in her case; but the Legislature of Massachusetts gave consent in 1819 that the people of the District of Maine should form a State constitution. This was done and the State of Maine was admitted in 1820.

Missouri, the eleventh in order, formed out of the Louisiana territory, applied for leave to form a State constitution: and it was upon this application that the restrictive clause concerning slavery was attempted to be applied. This gave rise to the Missouri compromise, and upon the adjustment of all conflicting matters the State was declared a State of the Union in 1821 by the President's Proclamation.

Arkansas and Michigan were admitted by one act of Congress in 1836—the former without condition, the latter prospectively—there being some questions of boundary involved. The constitutions of both States were made by conventions of the people without any previous act of Congress. The same was the case with Florida, which was admitted along with Iowa in 1845. There was a condition relative to boundary applied to Iowa which she did not comply with in form, but did substantially by presenting a new constitution, which being accepted by Congress, she came into the Union in 1846. The mode of the admission of Texas is familiarly known. Wisconsin, the last of the new States, went through the regular form of territorial organizatton, and formed its State constitution under authority of an act of Congress.

Indiana.

Terre Haute and Indianapolis Railroad.—We learn from the first annual report of this company, under date of January 5, 1850, that the grading and bridging of the whole line, with the exception of about 20 miles, has been put under contract. It is estimated that the whole work of grading can be completed by the first day of January next, and that the road can be prepared for running by the first of December, 1851.

The following extract from the report, shows the financial condition of the company, and the estimated cost of various portions of the work.

The cost of grading and bridging the road from Terre Haute to Indianapolis, ready for the superstructure, according to the Engineer's estimate, will amount to $317,188. To meet which, we have a subscription to stock, including the amount payable to Contractors on their contracts, of $232,600; to which add 30 per cent. on the balance of the grading and bridging, not under contract, payable in stock, amounting to $34,156; and the Commissioners of Vigo county will subscribe fifty thousand dollars, payable in the bonds of the county, at any time when called upon by the Company to do so—making in all the sum of $316,756, which amount will about cover the expenses oi preparing the road for the superstructure; and when this is done, we trust that it will give such increased confidence in the work, that we shall have but little difficulty in procuring a further subscription of stock sufficient to put on a good gravel bed and lay down the superstructure, which is estimated to cost $130,000, thirty per cent. at least of which can be paid in stock, leaving but $91,000 payable in cash. When the grading and bridging is finished, and the means procured to lay down the superstructure. we have every assurance that we can procure the Iron, and stock the road with Engines, Cars, &c., by a sale of the Bonds of the Company, secured by a mortgage on the road.

Our readers will recollect that the proposed road is 72 miles in length. The officers are

C. Rose, Terre Haute, Pesident.
T. A. Morris, Indianapolis, Chief Engineer.
W. D, Wood, Terre Haute, Asst. Engineer.

Ohio.

NEW RAILROAD PROJECT.

Our citizens are becoming much interested in a projected railroad from Wellington to Toledo, as the connecting link in a great western railroad that must soon be built. By tapping the Cleveland and Columbus road at Wellington, some forty miles in the great chain will be saved—and it is said that the difference in distance between this route and the one directly upon the lake shore is not worth mentioning—the road from Wellington, by avoiding the deep ravines, costing much less for construction than the other. Norwalk, Monroeville, Bellevue and Fremont, (Lower Sandusky), being made points. The project is a good and feasible one, and we trust it may eventuate in something more than mere talk.—*Norwalk Exp.*

Columbus and Xenia Railroad.—The rails for this road are all laid, and it is expected that the locomotive will be through to-day from Xenia. We learn that regular travel will not be commenced in less than two weeks.

We have just returned from a visit to the car factory of Messrs. Ridgway & Co., and report that four large passenger cars are nearly finished. They are "*first class*" in all respects. The execution appears equal to the first class cars of the eastern roads. The style and finish is rich, and the arrangement such as to ensure comfort. We think it will be a vast improvement in the little contracted nine passenger coaches, wherein the public are *packed* so uncomfortably at present.

The *time* to Xenia, from Columbus, will be two hours, including stoppages. This is something over 25 milee per hour.—*Columbus Jour.*

Waterville, Me., Feb. 18, 1850.

Mr. Editor—Permit me to inquire. if Mr. Johnson did not make a slight mistake in his calculation in his article in the Railroad Journal of Feb. 9th, on Railway Wheels? I presume it was an arithmetical error merely. In computing the line KL he must have made some mistake. Solids are to each other as the cubes of their similar sides;—hence the whole solid is to one half of it as the cube of CB is to the cube of LC; or CL eqnals CB (or .5 multiplied by the cube root of .5; or CB equals 39685 nearly. This makes NL 2·22685. But NB is to NL as AB is to KL. Whence we find KL equal to 3·823 nearly, and the proportion 3·1416 to 3·823, or as 1 to 1·217, or what Tredgold has 12¼ per cent. and Johnson 18 1-5 per cent, we find to be 21 2-3 per cent. nearly. This of course must affect the conclusions of Mr. Johnson somewhat, but only strengthen his position against Tredgold.

Yours truly,
J. H. D.

Tennessee.

Nashville and Chattanooga Railroad.

The second annual report of the directors of this company was submitted to its stocknolders at a meeting holden at Murfreesboro' on the 12th of December last.

Since the last report, important reductions have been made in the estimated cost of the road, which was originally estimated at $2,810,000. This has been reduced to $2 233,627. This includes an additional cost in weight of iron, amounting to $40,185, and the cost of the Shelbyville branch $52,843, which two sums deducted, leaves the cost of the road, including the iron, for which estimates were originally made, say $2,140,599, and the cost of equipage, depots and station houses, say $320,000 in all, making up the sum of $2,460,599. Take this amount from the original estimate including grading, bridging, timber, iron, engineering, etc., at $2,810,000, and depots, station houses, cars, etc., at $320,000 in all, $3,130,000, it leaves a balance of $669,410 saved on the original estimate, upon which the stock was subscribed.

The directors availing themselves of the low price of iron, have bought 10,340 tons, which is enough for the main line from Tennessee river to Nashville, 122 miles, and the branch to Shelbyville 8 miles, and side tracks, and turnouts, together with wrought iron chairs and spikes for the same.

This iron costs the company, delivered at Nashville, 1200 miles in the interior by water, about $45 per ton of 2240 pounds, or about two cents a ponnd, duty and all charges paid. A saving was made to the company of nearly twenty thousand dollars, under the best prices that could be obtained

at New York, by sending the President to England to purchase iron,

Over thirty thousand dollars were saved also on chairs, and $5,700 on the spikes, making, with the saving on the iron, upwards of $50,600, by sending directly to England for these articles.

The saving on these items, in the original estimate for their cost, is fully $375,000, over $50,000 of which was made by going directly to England as above stated.

In the cost of grading there has been a saving of nearly $300,000, which with the saving above, makes the whole saving to the company $669,401.

The directors have much pleasure in reporting that the contractors on the tunnel are proceeding with it with all the seeming ease and regularity of the simplest earth section on the road, and will finish it quite as soon as the earliest day it can be reached with iron from either end of the road.

This tunnel is near a half a mile long entirely through solid rock, and the approaches to it make nearly another half mile of cuts through the same material. Some parts of these cuts are fifty feet deep and some more. These, with the immense cuts and fills ascending and descending the mountain bluffs, through rock, make this pass, (the first through the Cumberland mountains,) a work of great magnitude, and one that has hitherto deterred even the most enterprising. To facilitate the construction of this tunnel, three shafts have been sunk 11 feet long by 7 wide, to an average depth of 170 feet each, also through solid rock. Two of these shafts are down to the heading, and one of them into the tunnel, with heads at work each way from it, and the third is within a few feet of being down.

The directors expect to commence laying down iron on the end of the road at Nashville early in the next summer, and if they can make such arrangements with the southern stockholders as will warrant them, they hope to place the end of the road next to Chattanooga all under contract early in the spring. This they hope will enable them to commence laying down iron, at that end of the road by the end of next year at farthest, and that by coming from each end to the centre, complete the work at an early day. If successful in effecting this arrangement in the south, the directors entertain a hope that they may by untiring energy and management, complete this entire work by the close of 1851.

If these expectations shall be sustained, they will have accomplished what no company has done in this country, within the same time, and considering the difficulties to be surmounted, with equal means. The road and branch are one hundred and fifty-nine miles long. The road crosses all the ranges usually known as the Cumberland mountains, and the Tennessee river, with a bridge sixty feet high and near a half a mile long.

The means of the company available for the work are as follows:

City of Nashville subscription.....	500,000
Individual "	806,753
City of Charleston "	500,000
Bonds of the State of Tennessee.....	500,000
	$2,306,753

The Georgia Railroad and Banking Company declined subscribing the $250,000 promised by them. This would have proved a severe embarrassment to the above work, but for the important reductions made in the original estimates.

This road is already beginning to exert a very important influence upon Tennessee and the neighboring States. Measures are now being taken to form a connection between Nashville and Louisville, and eventually with Lexington, Henderson, and other important points. The Nashville and Chattanooga road is to be the nucleus of a net work of railroads which will soon spread over the whole State of Tenessee as well as its neighbors.

AMERICAN RAILROAD JOURNAL.

Saturday, March 9, 1850.

Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK,
March 6, 1850. Troy, N. Y.

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The Railroad Journal.

The American Railroad Journal was the earliest work published in any part of the world devoted to the railway interest. In its pages is to be found the only full and complete history of railway progress, the only authentic record of the discoveries and improvements which the greatest of practical science has drawn forth and perfected.

The means of enhancing its value under its present proprietorship are far greater than when we assumed its charge about one year ago. It will continue to furnish the best practical results as to the construction and working of railroads, the details of progress in steam navigation, commerce, mining, manufactures, banking and the mechanic arts.

The best practical talent that can be enlisted in the country is engaged to supply its pages. The mining interest will find evidence of the first systematic attempt to give a full view of the iron, copper and lead ores of the country, with the results of practical working. In all the branches of mechanical industry we seek to discard the crude conceits of unskilled pretension, the thousand useless novelties issuing from the Patent Office, and to give encouragement to whatever can be made useful in relieving the wants, in ministering to the pleasures, or contributing to the advancement of the race.

We invite contributions to its pages from all who sympathise in our labors, information in any form from those most interested in the progress of mechanical invention, and substantial support from all who are willing to aid us in the arduous duties of our position.

☞ About 6 or 8 months since two young girls by the name of Davis, the daughters of a poor man residing in Brooklyn, on returning from school by the side of the track of the Long Island railroad, were overtaken by the locomotive, and the younger one was thrown down and had her knee joint so badly broken that it was necessary to amputate the limb. Her right arm was also badly fractured above the elbow, which was however set and is now sound.

It gives us much pleasure to state that Fowler M. Ray, Esq., of this city, who was a witness to the accident, has generously presented the sufferer with an artificial limb, made by the celebrated Mr. Selpho, with the knee, ankle and toe joints complete, which we have no doubt will greatly contribute to her relief.

Virginia and Tennessee Railroad.

Attention is invited to the advertisement in another column of the Virginia and Tennessee railroad, for proposals to furnish or manufacture iron for this road.

NEW YORK AND ERIE RAILROAD.

We are happy to announce that contracts have been closed for the entire completion of the New York and Erie railroad to Dunkirk on Lake Erie. It is let to ten different companies, or parties of contractors in sections varying from 7 to 20 miles each. The contractors are known as among the most successful class of contracors, and the present cheap price of labor and of iron, gives every assurance that the work will be completed and the road put in running order for less than $25,000 per mile, and probably for $2,000.

The success of this great work may now be considered as practically achieved. Its speedy completion is beyond the possibility ot a doubt, and the revenue which it now yields equals the most sanguine anticipations. Its extension to Lake Erie is now only wanting to illustrate fully the influence it is capable of exerting, not only upon New York, but upon the business of the whole country. By the time it reaches Lake Erie there is now every probability that the roads now projected and in progress along its south shore between Buffalo and Cleveland, will be completed. In one year from this time very important lines in Ohio and Indiana will be opened, and the New York merchant will be in constant communication with every part of the Union, and his business will not suffer from the long embargo which the ice puts upon the canal in the winter season.

NOTICE TO SUBSCRIBERS.

Such of our Subscribers as wish for back numbers of our paper to complete their sets, or who may not have received the index of the past year, are requested to send for them without delay.

Alabama.

We publish the following from a Mobile paper of the 6th ult.

Mobile and Ohio Railroad.—The annual meeting of the stockholders of the Mobile and Ohio railroad, was well attended on Tuesday evening, and the proceedings were of a very interesting character. The report of the executive committee, submitted by B. F. Clark, Esq., chairman, presented a full and luminous view of the operations of the company during the past year, its present condition, wants and prospects. It is an admirably written document, but too long for publication in our columns. It is soon to be published in pamphlet form. In the mean time we hope to be able to lay before our readers some interesting extracts.

Interesting speeches were made during the evening by Mr. Bilbo, of Nashville, Tenn., and Dr. Cunningham and Mr. Buck, of Noxubee county, Miss., which were warmly applauded by the meeting. A spirit of firm determination to push the work through without delay, pervaded the meeting.

The annual election of directors for the ensuing year was held yesterday, with the following result.

J. M. Cunningham, Miss.; John W. Campbell, Tenn.; Benj. E. Grey, Ky.; Sidney Smith, Francis B. Clark, Jona. Emanuel, John Bloodgood, David Stodder, George N. Stewart, Moses Waring, Charles LeBaron, Charles Gascoigne, J. A. Campbell, of Mobile.

The two last only are new directors. It is an excellent board, composed of gentlemen of intelligence, energy and wealth; entitling them to the fullest confidence of the stockholders and the community. That they will do their duty, no one can doubt. They are men who when they *resolve* know no such word as *fail*. We feel fully authorised to say *the work will go ahead*.

Explosion of a Locomotive Engine on the Camden and Amboy R. R.

On Friday of last week, the Engine No. 29, on the Camden and Amboy railroad, exploded in the neighborhood of Bordentown, killing instantly the engine driver, and another engine driver who was riding in company on the engine, and mortally wounding a fireman who has since deceased.

This is the *third* occurrence of the sort we have had occasion to chronicle, since our connection with this Journal, or in about one year past, upon the railroads in this country. Our views, so fully expressed on this subject last season, through the columns of this paper, have undergone no change.—Every aceident that has since occurred has confirmed our belief, then expressed, that these accidents are the result of culpable neglect, or inattention, and are not to be referred to any such extraordinary theory, as that assumed in Captain Parrott's report, read before the Boston Association of New England Railroad Superintendents, in the case of the Taghonic on the Boston and Providence railroad on the 1st of February, 1849.

The attempt also to throw the blame of these awful disasters upon the builders of locomotive engines, is in our estimation entirely unwarranted by the general testimony of the facts found in each case.

This case on the Camden and Amboy railroad is strikingly in point, in confirmation of these opinions. The doings of the Coroner's inquest are as yet only known to the public by the results of their deliberations. They report that the accident was caused "*by allowing the water to become low in the boiler!*" Here, in our estimation, is the secret of every explosion that has occurred in a locomotive engine. Here is the place to look for the causes of all these casualties, and the time has arrived when railroad companies should look to the remedy for these disasters.

This is a topic of inquiry full of importance to the whole travelling public. Every man who travels by railway should raise his voice toward arousing the directors of railroads to look this question full in the face. Few, very few, who travel by railroad know anything of the fearful hazards they are encountering every time they travel, from the carelessness, the neglect, the want of skill, in those who take charge of engines.

The locomotive engine is the brain of the whole system. The engine driver is the master spirit of the whole. These men should receive the highest pay of any class of men in the service of the railway, not excepting superintendents, conductors, or even directors themselves. The lives of the whole travelling public are in the hands of the men who drive the locomotives. Their responsibility should be properly appreciated, and their qualifications made matter of the most serious inquiry. A long course of training, a thorough acquaintance with the nature and uses of steam power, should be an indispensible prerequisite to their employment.—Their compensation should be graduated accordingly, and like the pilots of the Ganges, they should be held accountable for the lives and the property entrusted to their charge.

We intend to follow up this inquiry, and pursue this subject more into detail. We intend to urge upon the attention of legislators and railroad directors, the importance of passing such laws and such regulations as shall aid in carrying these views into effect.

In this case on the Camden and Amboy railroad, we have no doubt it was occasioned by the inattention of the engine driver. He took on a companion with him, and in the midst of their conversation, or their raillery, the engine was allowed to run on without any attention from him, till recollecting himself, and finding the water low in the boiler, he suddenly threw in a mass of water, upon the heated boiler surface, which exploded instantly, with a force beyond that of gunpowder; by the instant conversion of the water into a highly explosive gas. He and his companion paid a fearful debt for their indiscretion, and give a solemn warning to the living.

The inquiry arises, how could the company avoid the happening of such a catastrophe. The answer is a plain one: *By prohibiting the introduction of any one upon the engine* but those necessary to run it. In this case, as in thousands of others happening daily, the engine driver's attention is diverted from his duty by the presence of parties who should have been excluded from the place.

These suggestions are thrown out at this early stage, after the happening of the accident, while the public mind is still moved on the subject, in the hope of arousing the attention of those interested in this matter to the adoption of some measures that shall reach and remedy the evil.

Oronoco Steam Navigation Company.

The extension of our commercial intercourse, through the agency of steam navigation, is a matter of the deepest interest to our whole people.—Next to the railway, we regard steam navigation as the most important agency at work, towards carrying forward the great interests of business, and extending the blessings of good government, the arts, and the refinements of civilized life.

Some years ago, the government of Venezuela, in South America, granted to one Vespasian Ellis the exclusive right to navigate the Oronoco river for a certain number of years with steam vessels. This right was lost for reasons well known to our commercial men, and on the 11th of May, 1848, the government of Venezuela granted to Captain Turpin, for the benefit of Freeman Rawdon, Esq., of this city, the exclusive navigation of the Oronoco river with steam vessels for the period of 18 years, on condition that the grantees should within a specified time, place a suitable steamboat on said river.

For the purpose of securing this grant, and carrying out the intentions of the government, the grantees of this project in September, 1848, despatched Captain Turpin with the Steamer Venezuela to the Oronoco river. This boat reached Angostura, or Bolivar, in January, 1849, and has plied on the Oronoco from Angostura to the mouth of the Apure, (pronounced Apoorre), about 250 miles, thence up the Apure to Neutreas, about 600 miles in all from Angostura.

Captain Turpin recently arrived in this country for the purpose of arranging to place two other boats on the same line.

The Venezuela steamer was built at Pittsburgh and is about 400 tons burthen. It is proposed to have the others of still greater size, and capable of conveying increased burthens of freight. The principal trade of the Oronoco is coffee and hides.

There is no other steamboat line in any one of the South American rivers, and we have no doubt that the success of the Oronoco Steam Navigation Company will soon induce other parties to obtain further grants, and make further improvements in navigating the stupendous, but comparatively unknown rivers of South America. We think it cannot be many years before the Amazon shall be penetrated with steam vessels, to a great distance into the interior.

For the American Railroad Journal.

St. Louis and Kanzas Railroad.

Policy of Western Cities.

In a late number of the "Railroad Journal," I perceive by your extract from the Reveille that St. Louis is acting wisely. She has already taken steps to begin *her* "Great Western" railroad. It will perhaps, by a practicable route, touching the Maramec R., be about 300 miles to the western State line at the junction of the Kanzas and Missouri rivers. This railroad will travers nine fertile counties, populous for so new a country. It will cost at the estimate, when fully equipped for running, $20,000 per mile, say $6,000,000; and must earn some $720,000 per annum gross, say $360,000 *net*, to pay interest on its cost.

Now waiving all increase—and nowhere will a road *create* an increase of business more surely and rapidly than the Missouri road—I believe that with the California emigration now set in motion, if it were *done now*, it would be a paying railroad the first year. What then may we not expect for its future success?

But I set out to speak of the wisdom of St. Louis, *as a city*, in looking *westward*; leaving Illinois to take her time about "right of way," and all such selfish, silly, sectional legislation. Were I a citizen of St. Louis, I would be glad of the Eastern obstacle, seeing that citizens' capital is now looking *westward* for investment in an iron way.

About four years since, in conversing with the editor of a leading Pittsburg paper, I revived the subject of a *Western* railroad for Pittsburg, preferring that the effort to aid in an Eastern (central) road should lie over until a road should be completed to the *western State line*; believing that Pittsburg interests were mainly concerned in a western road towards the customers of the merchants and manufacturers of that city.

The editor concurred; and, as I understood, he took up the subject, and wrote several leaders to awaken attention thereto.

Unfortunately, a more "magnificent" scheme—including the *fancy* of a "back-bone" railroad route westward, seized a few leading men, some two years later, and unlike New York, who, in the infancy of her western railroad movements, was glad to get up *different* companies to make and extend her roads from point to point, Pittsburg must needs divide her limited surplus capital between an eastern and western project at the same time.

The Pittsburg editor, it is said, had, previously, most wisely, insisted on making the shortest possible line of railroad—say to the western line of the State—*via* the Ohio river: leaving to Ohio companies to extend it. The very circumstance of Pittsburg laying hold, and completing *forty miles of railroad to State line*, say at mouth of Little Beaver, would have enabled the Cleveland and Pittsburg

railroad company, of whose enterprise a favorable notice appears in the *Railroad Journal*, No. 9, to get sufficient capital to extend the road from the State line to Cleveland, by the time the Pittsburg and State line road would be completed.

Had the wise suggestions of the said editor been then followed, October, 1849, would have found cars filled with passengers and merchandise arriving and departing, running over this track, 150 miles from Pittsburg and Cleveland! and moreover the western extension railroad, diverging from the Cleveland road at head of "Hahn's run valley," (some 80 miles west of Pittsburg,) towards Canton, Massillon and Wooster, Ohio, would at this writing have been well under way.

The money market had been sounded, and it only required the assurance that Pittsburg would forthwith make her 40 miles to the State line and stock it, costing say $30,000 per mile, $1,200,000, or less—within the means of Pittsburg alone—to secure the capital for the Cleveland road; and also for another company to begin the Western road, commencing some 80 miles from Pittsburg. It is a curious fact, moreover, that in going west, taking the Cleveland railroad track to said point of divergence, will be found to increase the distance to Cincinnati only about five miles!

And nothing is more certain (your account of progress of the said Cleveland railroad in No. 9 of the Journal, confirming the certainty) than that Pittsburg would *now*, without embarrassment, have been in the enjoyment of the vast advantages of both a Western and a Lake road.

Pittsburg has lost three, perhaps five years, by her "tall" move for the "back-bone" route.

Three to five years of *Western railroad* advantages, in reaching their customers, are to the merchants and manufacturers of such a city as Pittsburg incalculably important. The loss of time is of itself an item in the lifetime of a merchant; and to the growth of a city, in these stirring railroad times, it is a loss that can never be wholly recovered.

It is even now probable from your extract concerning the Cleveland road, that notwithstanding the depressing influence of a competition for sixty miles at the southern end with a second road (the "back-bone")—and *two* were hardly necessary at the first—the said Cleveland road *may* reach Beaver yet, perhaps earlier than the "back-bone" road can be completed 80 miles to the point of crossing the Cleveland route.

And as to the road *west* of "Hahn's run valley," its construction is as yet, it would seem, far in the future.

I only allude to this great blunder of the city of Pittsburg—for *blunder* it surely was, as the policy of her leading paper, at the time alluded to, would have had her 40 miles of State line road finished and paying ten per cent. at the present; and the said investment, now aiding her Central Pa. railroad movements, instead of a source of embarrassment—to recapitulate that St. Louis and all similarly situated cities act wisely in first making roads in the direction of, and for the easy communication with their *customers*, whereby both sellers and buyers will be enriched; being careful to *finish* one section at a time, and put on the cars, to let it be earning money before proceeding further. Any other system I fear will be attended, by and bye, with a serious railroad revulsion, and great embarrassment among the holders of railway shares, and those who are liable for railway calls on unfinished lines.

P.

COMPENDIOUS STATEMENT,
Showing the Dimensions, Extent, and other details of the Provincial Canals,
UNDER THE BOARD OF WORKS, CANADA.

NAMES OF CANALS.	Length of canal in miles.	No. of locks including guard locks.	Lockage in feet.	Size of Locks. Length of chamber bet'n gates.	Size of Locks. Width in the clear.	Size of Locks. Depth on mitre sills.	Width of canal. At bottom.	Width of canal. At surface.	REMARKS.
Welland Canal—Connecting Lake Erie and Lake Ontario, and surmounting the Falls of Niagara.	....	24	....	150	26¾	8½	45	81	The St. Lawrence canal has two entrances into Lake Erie. One at Port Maitland, about 38 miles west of Buffalo; and the other at Port Colborne, about 20 miles from Buffalo. At both places the lake is generally open in spring from one to two weeks earlier than at Buffalo. This canal also communicates with the Grand River Navigation at Dunnville. Two of the large class of locks are situated below St. Catharines, and steamboats may ascend to that place.
The Main Trunk, from Pt. Colborne, L. E., to Pt. Dalhousie, L. O.	28	3	330	200	45	9	45	81	
The Junction branch to Dunnville, not added below	21	1	6	150	26¾	8½	35	71	
Broad Creek br. to Pt. Maitland, " "	14	1	6	200	45	9	45	85	
St. Lawrence Canals—Connecting Lake Ontario with the Atlantic:									
The Galoppes	2	2	8	200	45	9	50	90	These canals were completed in 1847. As steamers will always *descend* the Rapids outside of these canals they will not have to pass each other in them; and, consequently, the width of bottom is reduced 50 feet.
Point Iriquois	3	1	6	200	45	9	50	90	
Rapide Plat	4	2	11½	200	45	9	50	90	
Farren's Point	1	1	4	200	45	9	50	90	
Cornwall canal, passing the Long Sault Rapids.	11½	7	48	200	55	9	100	150	Completed, and in full operation.
Beauharnois canal, connecting Lake St. Francis and Lake St. Louis, and passing the Coteau, Cedar, and Cascades Rapids	11½	9	82½	200	45	9	80	120	Completed. The Royal Mail Steamers now descend from Lake Ontario to Lachine, within nine miles of Montreal.
Lachine canal, from Lachine to Montreal	8½	5	44½	200	45	9	80	120	Completed in 1848.
* Total from Lake Erie to the Sea	69	54	534½						Vessels of from 300 to 350 tons burden, may navigate these canals.

The distance from Lake Erie to Montreal, the Head of Navigation for Atlantic Vessels, is 367 miles; and the total fall from Lake Erie to Tide Water is 564 feet.

Lock and Dam at Ste. Anne's Rapids, head of Montreal Island	....	1	3 to 6	200	45	7	.....	.....	Completes the Navigation by the Rideau and Ottawa canals, and connects Lake of Two Mountains with Lake St. Louis. Is now in full operation.
Lock and Dam at St. Ours, on the River Richelieu	....	1	3 to 7	200	45	7	.....	.....	Completed in 1848; and steamboats from Quebec and Montreal may ascend to the Chambly Basin, and vessels from the Upper Lakes, with produce, may descend the St. Lawrence, and ascend the Richelieu and Chambly canal, to Lake Champlain.
Chambly Canal, connecting Lake Champlain and Chambly Basin	11½	7	120	200	45	7	.....	.....	Was constructed under the direction of Local Commissioners.

* To contrast the St. Lawrence route with that by the Erie canal. The dimensions, etc., of the latter are given below.

Erie Canal (State of New York)	363	84	688	90	15	4	28	40	These are the dimensions of the old canal, capable of passing boats not exceeding 75 tons burden.

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BY GEORGE DUGGAN,

ARCHITECT AND CIVIL ENGINEER.

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The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the FIRST DIVISION of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the FIRST DIVISION.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting $9, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States. To those remitting $5, and the remainder in six months, it will be sent regularly as published, POSTAGE UNPAID.

☞ *Engineers in charge of Railroad Works, are respectfully requested to send Tracings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work.*

STABILITY—SECURITY—PERPETUITY.

Mutual Life Insurance Co. of New York.

No. 35 WALL STREET.

A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York and United States Government.

This fund is rapidly increasing, by a widely extended and prosperous business.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured.

The premiums are payable in Cash annually, semi-annually, or quarterly, interest being added on the deferred payments.

The cash principle adopted by this company secures to the parties for whose benefit the insurances are effected, the whole of the advantages, without subjecting them to the heavy drawback of accumulated premium notes.

Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,	David C. Colden,
Wm. J. Hyslop.	Alfred Edwards,
R. H. McCurdy,	Wm. Betts,
Fred. S. Winston,	Joseph Blunt,
C. W. Faber,	Isaac G. Pearson,
John P. Yelverton,	Henry Wells,
Theo. Sedgwick,	Wm. Moore,
Stacy B. Collins,	Zebedee Cook,
John H. Swift,	Jona. Miller,
John Wadsworth,	David A. Comstock,
S. M. Cornell,	Robert Schuyler,
Gouv. M. Wilkins,	James Chambers,
John V. L. Pruyn,	Joseph Tuckerman,
Fred. Whittlesey,	Moses H. Grinnell,
Charles Ely,	Wm. J. Banker,
John C. Cruger,	Eugene Dunlih,
Walter Joy,	Francis S. Lathrop,
Alfred Pell,	John C. Thatcher.

JOSEPH. B. COLLINS, President.
ISAAC ABBATT, Secretary. 3m9

FARMERS! ATTENTION !!

John Mayher & Co's

NEW AGRICULTURAL WAREHOUSE AND SEED STORE,

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our *Stock* before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

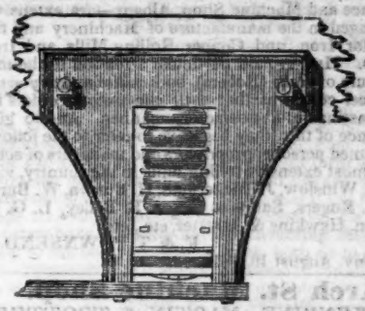
N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

CAUTION.

RAILROAD COMPANIES and others are hereby cautioned against using or vending our improvement for easing the lateral motion as applied on Railroad Cars. Letters Patent having been granted to us in 1841, any party or parties so making or using said improvement without license from us will be proceeded against according to law.

DAVENPORT & BRIDGES.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability.—Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

—

"I do not hesitate to allow you to say that I concur in Mr. M'Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'Rae had seen your springs (as I believe) and entertain it still." WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

—

Office of Sup't Norwich & Worcester R.R Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."
SAM'L H. P. LEE, JR.,
Sup't and Engineer.

—

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is *very much superior* to Ray's.
W. RAYMOND LEE, Supt.

—

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	$190·77	and weigh 2355 lbs.
The same with Fuller's Springs, . . .	131·71	" 1911 lbs.
Difference, . .	859·06	" 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

WHISTLER MONUMENT Association.

MAJOR T. S. BROWN having, in leaving this country, resigned his office as Treasurer of this Association, the Committee appointed for that purpose have selected as his successor GEO. M. DEXTER, Esq., of Boston.

Those desiring to subscribe will therefore please direct their communications to Geo. M. Dexter, Civil Engineer, etc., Boston, Mass.

A. W. CRAVEN, Secretary, etc.
New York, February 22, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of
STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;
Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with
(BIRKINBINE'S PATENT VALVES.)
B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats. Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

J. L. BROWN.

☞ Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required. 4tf

ENGINEERS.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W, H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebling, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Rahway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukie, Wisconsin.

Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

HOTELS.

JONES' HOTEL,
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
BRIDGES & WEST, ... Proprietors.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

BUSINESS CARDS.

Nathan Caswell,
METAL BROKER, 69 WALL ST., N.Y.
For the Purchase and Sale of Railroad Iron (new and old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Copper, Spelter, etc. Refers to
Messrs. Boorman, Johnston, & Co., New York.
" Grinnell, Minturn & Co., "
" Barston, Pope & Co., "
" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

VanRensselaer Stevens,
Sup't Transortation Providence and Worcester R.R., Providenc, R.I. Has had 13 years' experience in Operating Railroads. Will go South or West if applied to.

J. & Riley Carr,
Manufacturers of Cast, Shear, German and Blister
STEEL,
Of all Descriptions, Warranted Good.
BAILEY-LANE WORKS, SHEFFIELD.

R. S. DENTON, *Agent,*
NO. 20 CLIFF ST., NEW YORK.

STEEL AND FILES.
R. S. Denton,
20 CLIFF STREET, NEW YORK,
AGENT FOR
J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL
Of all descriptions. *Warranted* Good
FILES.
Manufacturers of Machinists' Warranted Best Cast Steel *Files*, expressly for woring upon Iron and Steel, made very heavy for recutting.
☞ A full Stock of *Steel* and *Files* at all times on hand. 6m4

Cumberland, (Md.,) Coals for Steaming, etc.
ORDERS RECEIVED FOR AND FILLED by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,
BROKER IN SCOTCH AND AMERICAN PIG IRON;
Bar Iron, Lead, Spelter, Tin, Copper, etc.,
No. 4 Liberty Place, MAIDEN LANE,
(Near Broadway,)
NEW YORK

Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESRLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & HarriS,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
☞SCHOOL OF CHEMISTRY.☜

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED —'Potomac' and other good brands of Pig Iron.

Railroad Car Manufacturer's Furnishing Store.

F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

RAIL ROAD CAR & CARRIAGE LININGS,

PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moreens, Rattinetts, Cloths, Silk and Cotton Velvets, English Buntings

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Starks & Pruyn,

MANUFACTURERS OF ALL KINDS OF

STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, Wm. F. Pruyn, ALBANY. Special Partner R. H. Pruyn.

Iron Railing, Bank and Vault Doors, Iron Shutters Bridge and Roof Bolts, Heavy Jobbing and Forging of all kinds.

☞ For particularss ee Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Samuel Kimber & Co.,

COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, *Civil Engineer*,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Morticing and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.

S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,

Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry,

THOMAS & COLLINS,

130 Quay Street, Albany.

To Railroad & Navigation Cos.

MR. M. BUTT HEWSON, *Civil Engineer*, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND Attorney for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steamboat and Stationary Engines, constantly an hand and for sale by

KENNEDY & GELSTON,
54 Pine St., New York.

October 27, 1849, 3m

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns' for sale by

COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.

DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1675 Tons, weighing about 61 lbs. per yard, 90 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Feb. 25, 1850.

N.B.—B., J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the Unitad States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the *very best* quality for special purposes, is respectfully invited.

COOPER & HEWITT,
17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES. — The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head; From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, *Agent.*
Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Bro., Baltimore Md

LAP—WELDED

WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,
Patentee.
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron. THOMAS B. SANDS & CO.,
22 South William street,

February 3, 1849. New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, *President*
Troy, N.Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N.Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phœnix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehannah river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MAGHINE SHOP
In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete
☞Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.
☞ Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.
June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by
ICHABOD WASHBURN.
Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300	Tons	A 1,	Iron Dale	Foundry Iron.
100	"	1,	"	"
100	"	2,	"	"
100	"	"	Forge	"
400	"	Wilkesbarre	"	"
100	"	"Roaring Run"	Foundry	Iron.
300	"	Fort	"	"
50	"	Catoctin	"	"
250	"	Chikiswalungo	"	"
50	"	"Columbia" "chilling" iron, a very superior article for car wheels.		
75	"	"Columbia" refined boiler blooms.		
30	"	1 x ¼ Slit iron.		
50	"	Best Penna. boiler iron.		
50	"	"Puddled"	"	
550	"	Bagnall & Sons refined bar iron.		
50	"	Common bar iron.		

Locomotive and other boiler iron furnished to order.
GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale *Hot Blast* Charcoal *Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces; Cold Blas.* Charcoal Pig Iron from the *Cloverdale* and *Catawba*, Va., Furnaces, suitable for *Wheels* or *Machinery* requiring *extra* strength; also *Boiler* and *Flue Iron* from the mills of Edge & Hilles in Delaware, and *best quality Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.
American Pig Iron of other brands, and *Rolled* and *Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and Rich & Cos. New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.
Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.
LEMMON & GLENN,
6m9 62 Buchanan's Wharf, Baltimore.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150	tons	No. 1 Boonton	Foundry Pig Iron.
100	"	No. 2 do.	do.
300	"	Nos. 2 & 3 Forge do.	do.
100	"	No. 2 Glendon do.	do.
140	"	Nos. 2 & 3 Lehigh Crane do	do.
100	"	No. 1 Pompton Charcoal	do.
100	"	New-Jersey Blooms	
50	"	New-Jersey Faggoting Iron, for shafts	

Best Bars, ¼ to 4 inch by ¼ to 1 inch thick.
Do do Rounds and Squares, ½ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, ¼ to 1 in. Ovals & Half Ovals ½ to 1½ in.
Bands, 1½ to 4 inch. Hoops, ½ to 2 inch.
Trunk Hoops, ½ to 1½ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.
DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,
PARK WORKS, SHEFFIELD,
Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.
All of which are offered for sale on the most favorable terms by WM. JESSOP & SONS,
91 John street, New York.
Also by their Agents—
Curtus & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, setts immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.
For sale in tight barrels, well papered, at their office by OGDEN & MARTIN, 104 Wall st.
February 16, 1850. 1y*
The above cement is used in most of the fortifications building by government.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.
JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

Railroad Iron.

1,500	Tons	weighing 53 lbs.	per	lineal yard.
500	"	" 57	"	"
500	"	" 56	"	"
500	"	" 60 & 61 lbs,	"	

Also 2½x½ flat rails. All the above being of approved patterns. For sale by
DAVIS, BROOKS, & CO.,
68 Broad street.
N.B.—Rails imported on commission, or at a fixed price.

Railroad Iron.

CONTRACTS for Railroad Iron of any pattern or weight and of a favorite brand, delivered at any port of the U. S., made on favorable terms by
CHARLES ILLIUS,
3m9* 20 Beaver St., New York.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, *at less than half its cost*, the following *new machinery*, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz.
2 Wrought Iron Cranks, 60 inches from centre to centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).
The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to
HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.
The improvement consists in being able to use either end of the screw, as occasion requires.
It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.
Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.
JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.
No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.
They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,
Prest. Beaver Meadow Railroad & Coal Co.,
Philadelphia.
or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.
May 19, 1849. 20tf

SPRING STEEL FOR LOCOMOTIVES TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1½ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address J. F. WINSLOW, *Agent*,
Albany Iron and Nail Works.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and *warranted to perform well.* Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price $1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 12 inches diameter. Suction Hose. *Steam Packing*—from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

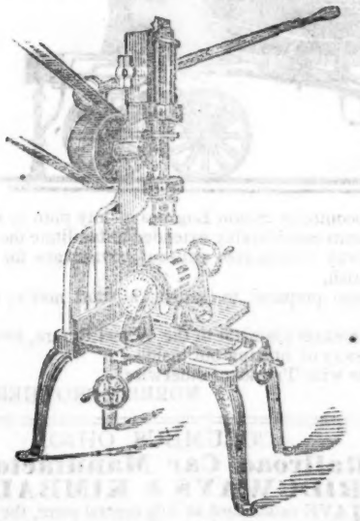
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

Capt. Alfred Swingle's PATENT BORING & MORTISING MACHINE.



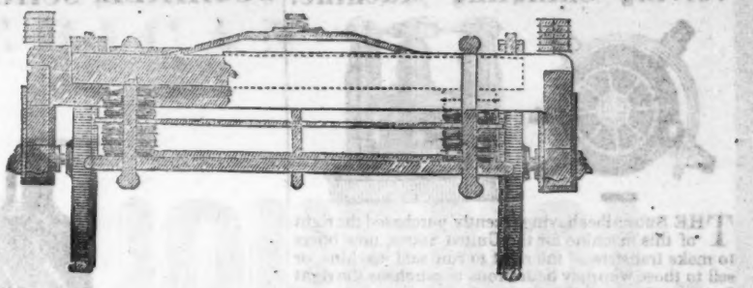
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

FULLER'S PATENT INDIA RUBBER CAR SPRINGS.



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorised to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alledges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are G. M. KNEVITT, 38 Broadway, N. York, General Agent for the U. S.: and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad* and *Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road

New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.
St. Johnsbury, Vt.

Agents, { FAIRBANKS & Co., 81 Water St., N. York.
A. B. NORRIS, 196 Market St. Philadelphia.

April 22, 1849. 1y*17

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat *as any that has been or can be made by any person*—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.

New York, October, 1849.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL AND

Best Cast Steel Royal Improved Files, well known is better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

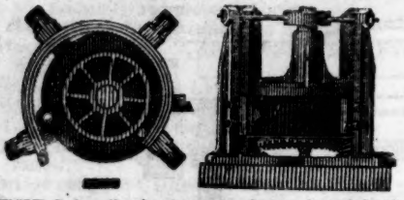
Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent.,
218 Pearl st., New York.

February 25, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phœnixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has give universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery *for making Spikes*, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNdersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNdersigned, the *Original Inventor* of the *Plate Wheel* with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

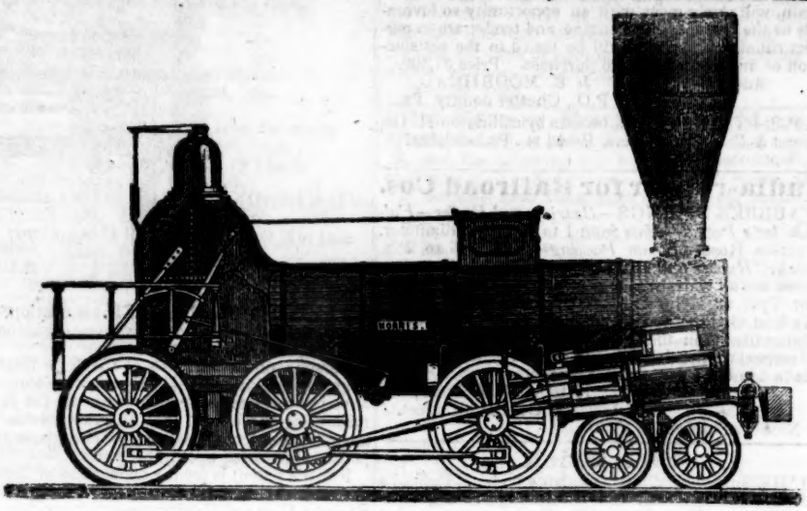
A. TIERS,
Point Pleasant Foundry.

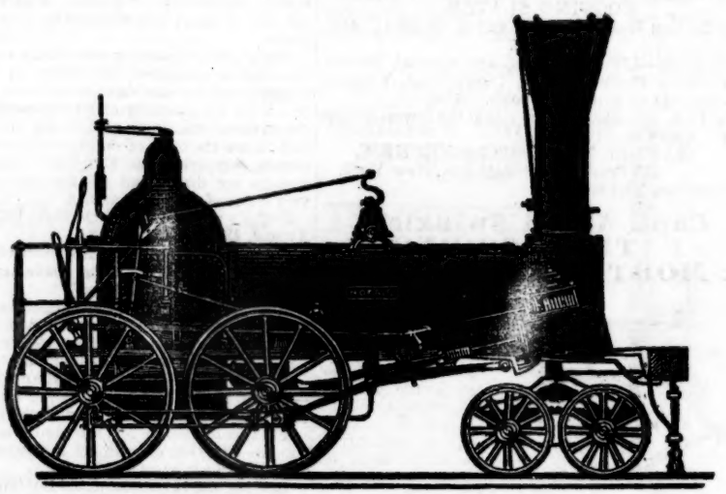
He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country. A. T.

Kensington, Philadelphia Co.,
March 15, 1848.

NORRIS' LOCOMOTIVE WORKS:

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,





THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size.

Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tires are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by JOHN W. LAWRENCE,
142 Front-street, New York.

☞ Orders for the above will be received and promptly attended to at this office. 32 1y.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

COLUMBUS, OHIO,

Railroad Car Manufactory.

RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

To Inventors and Patentees.

OWEN G WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., up stairs. 1y3